



# MTC Sampling Software

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# Why do we need It?



- Part of larger effort
- Implement Statistical Sampling
- MTC / Other states started 10 years ago
  - *Some already did this*
  - *Most did block sampling all the time*
  - *Some still do block all the time*

# Is Statistical Sampling Necessary?



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## ■ Some facts...

- ☐ Auditors will do sampling
- ☐ Sampling used to value assessments
- ☐ If accuracy is not a concern, you can be efficient by accepting any type of sampling
- ☐ Only way to measure accuracy is with statistical sampling
- ☐ Taxpayers expect accuracy

# Is Statistical Sampling Necessary...



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## ■ Conclusion:

### ☐ Part of quality auditing

- *If you agree quality = accuracy*
- *Maybe some unconcerned about accuracy*

### ☐ Block sampling is still OK

- *but maybe not always the first or only choice*

# Quality: Quote from per W Edwards Deming



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- a) “When people and organizations focus primarily on quality ... quality tends to increase and costs fall over time”
- b) “However, when people and organizations focus primarily on costs, costs ... tend to rise and quality declines over time”

- *statistician, college professor, author, lecturer, and consultant*
- *Credited with improving production in the US during WWII*

# Obstacle & Cure

(in applying statistical sampling)



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- How to do it
- Training
- Auditor reluctance
- Taxpayer non-acceptance
- Difficulty
- Consult w/ experts
- MTC Sampling classes
- State policy / manuals
  - require quality auditing
  - (top down expectation)
- Proposed MTC Model Reg
- Software

# Software Problems



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- Free software not suited for specific needs
- Software not from “auditor’s perspective”
- Cumbersome packages

# Examples of Software Awkwardness



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- Steps don't make sense
  - *to the auditor*
- Not seamless with Excel
  - *where the auditor is at!*
- Upload batch or text files
  - *auditor required to know special skills*
- Extraneous Information
  - *Statisticians love statistics – auditors don't always*



# Goals of MTC Statistical Software



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- Encourage random sampling
- Make easier, w/o lessening quality
- Provide relevant information at right time
  - *to the auditor*
- Reduce/eliminate mundane tasks

# Risks Dangers & Problems



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- Use validates process
  - *very bad assumption!*
- Replaces auditor's judgment
- Promote beliefs not supported by truth
- Misuse by auditors
  - *See first bullet point*
- Misuse by others
  - *See first bullet point*

# Risks Dangers & Problems ...



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- Promote undesirable values:
  - *“Just give me the answer... I don’t want to know more than that”*
- Too specialized
  - *Automation of infrequent tasks*
- Spoon-feeding / Automation gone awry
  - *Lack of involvement with the process...*

# Risks Dangers & Problems...



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## ■ Deming on automation:

- ☐ *“Robots painting robots”*
- ☐ *Proponent of semi-automation over full automation*
- ☐ *Promote involvement*
- ☐ *Minimize mundane tasks*

# Intended Use



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- Sales and use tax random sampling by state auditors
  - ☐ *Non-electronic*
  - ☐ *Electronic*
- MTC training classes

# Who can use Software outside MTC Training?



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- Auditors who take MTC sample training
  - *May include those who have taken training*
- MTC audit staff
- State sales/use auditors
  - *Compact & Sovereignty states if their state approves the software*
- Non-government/others?
  - *Not Decided*
- No distribution until testing completed

# Restrictions ...

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- Not fully decided
- Likely no charge
- Development costs reimbursed through
  - ☐ Class fees
  - ☐ MTC Audit fees
- Distributions of software restricted to
  - ☐ Anyone taking class in class
  - ☐ Certain government users after class
  - ☐ MTC staff at any time
  - ☐ Compact/Sovereignty state auditors at any time



# Restrictions ...



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- Will likely have disclaimers on Non-MTC use
- ***Non-MTC use will not be “supported”***
  - Must have internal programmers
  - External support difficult due to custom MS Office installs

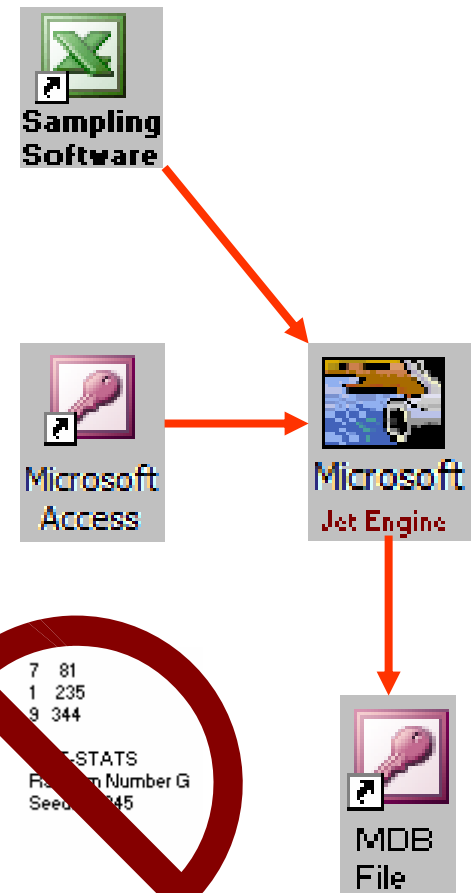


# What sets it apart

- Works totally in Excel
  - Macro based (VB/VBA programming)
  - Access/dBase files read directly into Excel
- No outside upload text files
- Automation on audit workpapers
- Stratification Analysis on one screen



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# Requirements



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- Windows XP or Vista
- Probably not work on Apple based computers
  - *Some VBA code is unique*
- Excel 2000 or 2003
- MS Jet Engine (almost always installed with any version of MS Office)
- Office VBA must be activated
- VBA Security must be able to be set by auditor

# Requirements...



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- Probably works in Excel 97
- Excel 2007 eventually
- Versions before Excel 97 incompatible
- **Necessary component reference libraries**
  - *or the ability to install by user/administrator*

# Key Features



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- Very good random number generator
  - Mersenne Twister
- Time Period Sampling
- Automatically produces all sample workpapers
- Statistical evaluation within Excel's VBA

# Key Features...



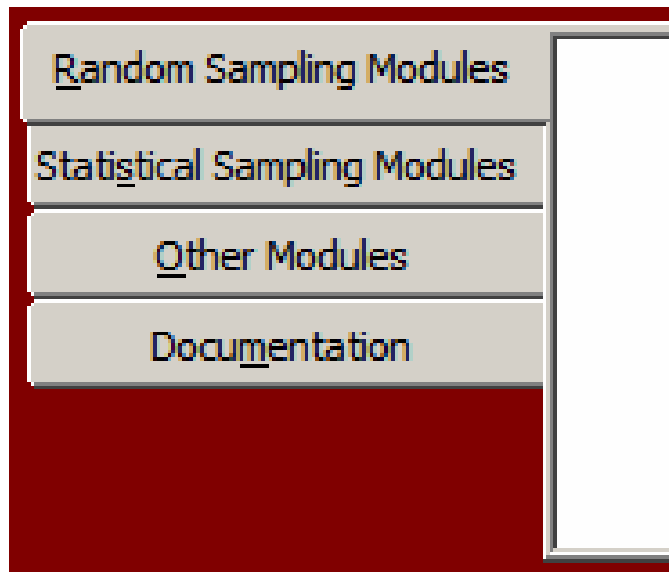
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- Stratified Samples taken all at once
- Detail stratum automatically inserted
- **Stratification Analysis**
  - Key decisions on one screen

# Module Groupings



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- Non-electronic random sampling (*non-statistical sampling class*)
- Electronic sampling (*statistical sampling class*)
- Sampling tools and utilities (*other modules*)
- Documentation

# Simple Random Sampling Modules



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- SRS
  - Random numbers between 1 and high #
- Time Periods
  - Days
  - Months
- Frames and Sets as is found in RAT-STATS +
  - More sets than RAT-STATS
  - Can mix sets/frame setups
    - *(not possible in RAT-STATS)*
  - Add labels to frames and sets
    - *(feature not in RAT-STATS)*

# Electronic Data Sampling & Statistical Sampling Modules



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- Stratified Samples Excel Data
  - ☐ Restricted to Excel record limit (for a sheet)
    - *Excel 2007 limit very large*
- Stratified Samples database files directly (*from Excel*)
  - ☐ **Not** restricted to Excel record limit
    - *Data limited to MS Jet Engine limit*
  - ☐ dBase or MDB files
- Statistical Evaluation
  - ☐ One/Two sided
  - ☐ Multiple Confidence limits
  - ☐ Not state specific



# Tools



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- All (except last one) taken from WA eSampling Tools
- Negative Matching (*Zapper*)
- Analyze Excel File
  - ☐ *Profiles data in many files*
- Combines Excel Files
  - ☐ *Combine data into a single file*
  - ☐ *Also can send data to mdb file*
- List or Compare Files
  - ☐ *List contents of folders*
  - ☐ *Compare contents of two folders*
- Sudoku Solver
  - ☐ *The computer solves puzzle (cheat)*

# Documentation Modules



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- Evaluation help *(for statistical evaluations)*
- Background on Random Number Generation
- MTC Sampling Manual
- Notation and Formulae *(statistical sampling)*